# UNIVERSITY OF CALIFORNIA.

## AGRICULTURAL EXPERIMENT STATION.

BULLETIN NO. 13.


[In order to render the results of investigations and experiments conducted by the Agricultural Department of the University of California more quickly and more generally available than has heretofore been done through the annual or biennial reports, it is proposed to embody hereafter, in the form of "Bulletins," to be issued as often as may seem desirable, reports of results, as well as such other discussions, information or answers to questions as may be of general interest. It is intended to make these bulletins, as a rule, short enough for insertion in the daily or weekly papers of the State, and proof-slips of the same will be regularly mailed to papers applying therefor. The substance of these bulletins will ultimately be embodied in a more complete and connected form, in the annual reports of the College of Agriculture.]

## Examinations of Red or Claret Wines from Mr. H. W. Crabb, Oakville, Napa County.

In previous bulletins giving the results of the examination of wines (Nos. 6, 9 and 12), stress has mainly been laid upon the differences shown in the composition of *one and the same kind* of grape and wine grown in different localities; the object being to show that differences so serious may occur between the products of such as differ materially in climate or soil, or in both, as to render the blends most successfully made in *one* case totally inappropriate in others. In the present issue the object is to show the differences in the composition of wines made from *different* grape varieties grown in the same locality and on the same soil, and treated precisely alike by a skilled wine-maker. It will thus appear what are the characteristic points of each variety, so far as chemical analysis can show them, thus indicating the direction in which proper blends may be sought with the best promise of success. It should be fully understood and remembered that while defects shown by analysis are perfectly definite indications as to the conditions that must be fulfilled in a successful blend, yet analysis cannot as yet take cognizance of the delicate and almost intangible flavors or "bouquets," which must likewise be made to harmonize in order to satisfy a cultivated palate. To that extent the determination of the proper blends must always remain with the expert wine taster; but the work of the latter is immensely facilitated by being informed, through the analysis, of the prominent chemical peculiarities, which in any case must be taken into consideration, and which ordinarily are left to laborious and more or less blind guessing and experimenting.

The wines of which the analysis are given below, were made by Mr. H. W. Crabb, of Oakville, Napa county, from grapes grown by himself, on a soil of remarkable uniformity over a considerable portion of the upper Napa valley. It is a gray, moderately retentive loam, easily tilled, although intermixed with a sometimes very considerable proportion of fragments of a shaly rock that forms the main body of the adjacent hills on the west side of the valley. The soil is of considerable depth, sometimes several feet without obvious change, and being then underlaid by a bed of gravel, may be considered naturally well drained. It is in this respect unlike the somewhat heavier soil, free from stones, that forms considerable tracts at other points in the region, but has a subsoil of a stiff clay, and is materially benefited by underdrainage. In chemical composition, the two kinds of soil are probably not widely different. Mr. Crabb's soil has not been analyzed. A sample of the other variety from the land of Mr. Wheeler, near Rutherford, shows a very high supply of potash, a moderate one of lime and of phosphoric acid, and an abundant one of humus; forming, altogether, a soil of high quality for almost any purpose, but especially adapted to the vine by its high percentage of potash. The extraordinary crops (of twelve to thirteen tons per acre) sometimes obtained north of St. Helena, grow on a somewhat lighter soil, of great depth, but remarkably well drained by underlying gravel.

All the grapes here mentioned were fully ripe, and were fermented on the skins until the first active fermentation was over; say from five days to a week, or sometimes more.

ANALYSES OF CLARET WINES FROM H. W. CRABB, OAKVILLE.

| NAME OF GRAPE. | Vintage..... | Solid Contents by Spindle..... | ALCOHOL. By Weight.. | ALCOHOL. By Volume.. | Tannin ..... | Acid calculated as tartaric ..... |
|---|---|---|---|---|---|---|
| Zinfandel..... | 1882 | 2.310 | 9.92 | 12.36 | .099 | .570 |
| Zinfandel..... | 1883 | 2.690 | 10.07 | 12.55 | .074 | .432 |
| Mataro ..... | 1882 | 2.242 | 9.92 | 12.36 | .100 | .495 |
| Mataro ..... | 1883 | 2.690 | 10.63 | 13.10 | .085 | .345 |
| Charbono ..... | 1882 | 1.916 | 8.41 | 10.50 | .110 | .375 |
| Charbono..... | 1883 | 2.463 | 9.78 | 12.18 | .130 | .420 |
| Malbeck ..... | 1882 | 2.181 | 10.81 | 13.27 | .088 | .375 |
| Crabb's Black Burgundy.. | 1882 | 2.310 | 9.34 | 11.65 | .145 | .596 |
| Gamay Teinturier..... | 1882 | 2.56 | 10.81 | 13.27 | .092 | .555 |
| Pied de Perdrix..... | 1882 | 2.56 | 9.99 | 12.45 | .125 | .600 |
| Grosse Blaue..... | 1883 | 3.44 | 9.92 | 12.36 | .239 | .387 |
| Cabernet Sauvig. of Medoc | 1883 | 2.94 | 10.44 | 12.90 | .113 | .390 |
| Tannat..... | 1883 | 2.99 | 10.07 | 12.54 | .197 | .397 |

In order to correlate somewhat this interesting series with data heretofore published, it should be remembered that Crabb's Zinfandels of 1882 and '83 showed, in comparison with those from other localities, a medium body higher than in those from Krug's, a medium alcoholic strength (average 10.0 by weight); rather low tannin, though more than Krug's

*It may be well, before an incorrect pronunciation of this name becomes firmly established, to note that it should be pronounced with the accent on the last syllable Mataró from the town of that name in Catalonia, Spain.

valley wine; and a medium average of acid. In the same connection, it should be kept in mind that in French table clarets (the type mostly desired) the average body is about 2%, alcoholic str. 8 to 9%, tannin 18 to 20 pro mille, acid 5 to 6 pro mille.

### Body.

The determination of the solid contents of wine gives the nearest approach to the numerical representation of what is designated as "body" by wine tasters; yet the sensation is materially influenced by the presence of other matters, notably by that of glycerine, which, other things being equal, is usually most abundant in wines having undergone a rapid and high fermentation.

The table shows the lightest body of all (1.916) for the Charbono of 1882, and the next lowest (2.181) for Malbeck of that year. The Mataro * comes next with 2.242, and then Crabb's Black Burgundy and with 2.310 in the same year. Apart from the Charbono, whose coarseness will exclude it from all choice blends, these are sample varieties, which may be expected to form the main body of claret wines in California, as two of them already do in France. From these there is a sudden ascent to the high bodied Gamay Teinturier and Pied de Perdrix; varieties which in more respects than this can be considered only as materials for blending.

Passing to the vintage of 1883 we find, so far as the comparison reaches, a higher body throughout; the increase being 16.5 per cent for Zinfandel, 10 for Mataro and over 25 for Charbono. Taking this into consideration in our estimate of the comparative percentages the Grosse Blaue still stands far above the Gamay and Pied de Perdrix as a body—giving wine; while the Cabernet and Tannat would stand about on a level with those just named, and would be classed as blending material chiefly.

### Alcoholic Strength.

A cursory glance shows that in this respect, also, the Charbono is the lowest of all, (8.41), while Malbeck and Gamay stand highest (10.81). As regards the Malbeck, this result is some what unexpected. Mataro comes next with 10.63, and Cabernet close to the same. the rest differ but slightly from the general average of 10 per cent by weight, except that Crabb's Burgundy, contrary to expectation, is considerably below, being 9.34 in 1882, which would place it at about 9.50 in 1883.

### Tannin.

On this essential point the table gives most important and gratifying information. Of the list, the Zinfandel and the Mataro of 1883, and the Malbeck and Gamay of 1882, alone range materially below 10 pro mille; while of those ranging above, the Grosse Blaue, stands highest, with nearly 24 pro mille; the Tannat next with 19.7; Crabb's Burgundy next with 14.5; the Charbono and Pied de Perdrix nearly together, 13 and 12.5.

### Acid.

In regard to acid, it is evident that on the whole that of the wine of 1882 was high; the Charbono forming an exception. Comparing the wines of that year, we find in descending order, four, viz., Pied de Perdrix, Black Burgundy, Gamay and Zinfandel, ranging between 5.55 and 6.00 pro mille, with Mataro close up to 5.00. The rest range mostly between 3.45 and 4.00. It is noticeable that in a year of high acid, Malbeck was so low that it fails to dilute well, while Crabb's Burgundy and Zinfandel, as well as the Perdrix, had nearly the typical 6.00. Gamay has, in the same year, 5.55 and Mataro nearly 5 00. In 1883, a year evidently of low acid, all the French varieties represented, except the Charbono, fall near, but somewhat below, 4.00 pro mille. It is evident that making allowance for the difference in vintages, the Burgundy, Gamay and Pied de Perdrix would, with the Zinfandel, have remained above 4.00 pro mille in that year, and furnished a fair supply of acid.

In drawing the practical conclusions from the above data, it is painfully apparent how much the absence of the comparison of at least two vintages *throughout* the series, impairs its value. Some of the omissions may still be filled through the courtesy of Mr Crabb; but even as the table stands, some very important points may be derived from it.

The most obvious one is, that so far as chemical analysis can determine the matter, Crabb's Black Burgundy stands nearer to the composition of French clarets than the wines made from the typical French grapes—Malbeck and Mataro when grown in the climate of Napa. Something may be due to the youth of the vines from which the last named varieties were derived; but according to the usual assumption, the difference from that cause should be the other way.

Next in importance is doubtless the remarkable quality of the Grosse Blaue, as a wine for blending, imparting both body and tannin in a remarkable degree. Adding to this its low acid, and the fact that the color of this grape is very intense and of a very desirable shade, it cannot fail to become of considerable importance for blending purposes. Chemically it would seem to be the very thing for correcting the high-acid, low-tannin and low-color Zinfandel wines of the valleys.

A more detailed consideration of other points would render this bulletin too lengthy, and is reserved for the future; the more as some other series, now in hand, will throw additional light upon the peculiarities of some of the grape varieties concerned.

E. W. HILGARD.

*Berkeley, Aug. 8, 1884.*